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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The Official Journal of the Rocks and Minerals Association

Chips from the Quarry

A MUSEUM FOR THE BLUE RIDGE PARKWAY

PETER ZODAC

On page 388 of this issue of ROCKS AND MINERALS appears an interesting item relative to a proposed mineral museum for the proposed Blue Ridge Parkway. The author of the item is Bradley Johnson, of Penland, N. C., and a member of the Rocks and Minerals Association.

The item calls attention to the importance of a mineral museum along a scenic parkway that will be 477 miles in length and traverse sections of the United States which are already world famous for their mineral occurrences. When the Parkway is finished, it will attract from far and near tourists who may primarily be interested only in the scenic beauty of the States it will traverse. It is being built for that purpose, but, as there is no toll to pay it will also be the expectation and hope of the States the Parkway will cover, that besides the tourists' trade, capital and business enterprise may also be attracted to these commonwealths. The proposed museum should accomplish much in this direction, for within its walls could be gathered and shown in pictures, dioramas, or in the objects themselves, the products, manufactures and the natural or mineral resources of the States the Parkway will cross. As the route will traverse country rich and famed beyond its borders for its minerals, as complete an exhibit of them as can possibly be assembled, should have a prominent place in the museum. This mineral exhibit should draw mineralogists and individuals interested in minerals from all parts of the United States, and many of them could be held for days if printed information could be had showing localities where collectors could collect for themselves, and the routes to them.

We heartily endorse the idea of the museum, but could suggest that each State the Parkway will serve should have a museum of its own. It is the State of North Carolina that is contemplating the erection of the museum mentioned by Mr. Johnson.

Someone, we assume, will be appointed curator. For this position we should like to nominate Mr. Bradley Johnson. Mr. Johnson, we believe, is well qualified for the office. He is a mineral collector of many years experience and an authority on North Carolina minerals, and their localities. He is courteous, honorable, loyal, friendly, and a tireless worker; a gentleman whom it is a pleasure to meet. With him installed as curator of the proposed museum, the minerals of North Carolina and the neighboring States would be assured of publicity and prominence as they never before enjoyed but have always deserved.

We urgently appeal to all readers of ROCKS AND MINERALS, and especially to our members, to first read Mr. Johnson's item and then to write *immediately* to the Director, National Park Service, Dept. of the Interior, Washington, D. C., warmly endorsing the establishment of the mineral museum along the Blue Ridge Parkway and the appointment of Bradley Johnson, of Penland, N. C., as its curator.

Peter Zodac

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Whole No. 101

MINNESOTA'S THOMSONITE BEACH

By FRANKLIN B. HANLEY
Department of Geology, University of Minnesota

Thomsonite Beach, on the north shore of Lake Superior near the tip of Minnesota's Arrowhead country, is the occurring locality of most of the thomsonite used as gemstones. This mineral constitutes an interesting semiprecious material of at least local renown[1]. Both cut and natural stones, as well as mounted ones are stock items in all jewelry and novelty stores in the northeastern part of the state. They make a distinctive souvenir and represent what is essentially the unofficial gemstone of Minnesota.

The finest Minnesota thomsonites have been found in the vicinity of Thomsonite Beach near Grand Marais, Cook County. (See inset key map) Thanks to the recent relocating and hard surfacing of the highway a visit to this locality now can be made easily, comfortably, and quickly. It is a pleasant one, too, for the approach is by the North Shore Drive or Lake Superior International Highway (U.S. #61) which follows the scenic coastal zone of Northeastern Minnesota. (See footnote.)

Thomsonite Beach is on the direct route from Duluth to the Gunflint Wilderness section of the Superior National Forest or to the Nipigon-Thunder Bay region of Ontario. It may be reached with but little extra mileage as a side trip on a "circle tour" of the Vermilion and Mesabi Iron Ranges. Thomsonite Beach, even as the main objective of a trip into Northeastern Minnesota, will prove worthwhile for the mineral collector or amateur lapidary.

Before discussing the details of Thomsonite Beach, a word or two about the mineral. Commonly speaking, thomsonite is a member of the rather diverse Zeolite family of minerals. For our purpose here, we may consider it as a hydrous calcium, sodium, and aluminum silicate of somewhat variable composition. The formula given in Dana's Textbook of Mineralogy[2] is $(Ca,Na_2)\ Al_2Si_2O_8.2\frac{1}{2}H_2O$. As a matter of fact the name thomsonite is applied to a number of closely related chemical compounds which vary chiefly in the proportions of calcium and sodium. The group forms an isomorphous series analogous to and apparently allied with the plagioclase feldspars[3].

In this connection it is interesting to note that N. H. Winchell, State Geologist of Minnesota from 1872 to 1900, in his later reports[4] insisted that most of the material commonly known as *thomsonite* is in reality the mineral *mesolite.* Further, he followed the suggestion of Peckham and Hall[5] that the green, waxy-luster amygdules and pebbles constituted a separate mineral, *lintonite*.

In common with the other zeolites, thomsonite is a secondary mineral forming in preexisting openings or spaces, such as bubble holes in lava flows or along joints in these and other rocks. Although the process is not well understood, thomsonite is considered by many to have been derived from the reaction of the feldspars of the basic lavas with the hot waters and gases associated with eruption. The de-

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Footnote: For an excellent discussion, illustrated with a series of route maps, of the geological features along this highway see G. M. Schwartz, "A Guidebook to Minnesota Trunk Highway No. 1." Minn. Geol. Surv., Bull. 20, pp. 62-88, 1925. This publication may be obtained from the University of Minnesota Press, Minneapolis, Minn. Price $.50 postpaid.

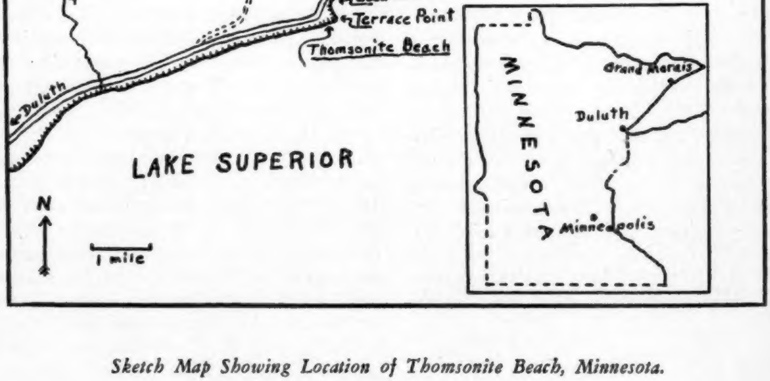
position of the thomsonite in the amygdaloidal cavities, or bubble holes, is believed to have taken place shortly after the solidification of the lava flow.

Regarding the physical properties of thomsonite, the noteworthy ones are its radiated structure and unique color arrangement. Frequently even the smaller specimens display several centers from which fibrous-appearing structures diverge. The colors commonly observed include white, pinks, browns, reds, and grayish greens. The specimens in demand for jewelry have "eye markings", that is, several of these colors arranged in successive concentric bands in conjunction with the multicentered radiated structure.

Like most other zeolites, thomsonite has a comparative low specific gravity (2.3-- 2.4) and only moderate hardness (5 - 5.5) If it were more resistant to abrasion it would rank higher as a semiprecious mineral. The luster is viterous to pearly, but in some of the dense forms it is dull to waxy. Most specimens have a low order of translucency, however, the lintonites may be relatively high. The streak is uncolored. Thomsonite is brittle and the fibrous forms tend to break along these structural lines. This mineral belongs to the orthorhombic crystal system but distinct crystals are very rare in the Thomsonite Beach area.

Although Winchell[6] distinguished between thomsonite and mesolite on the optical properties visible under the microscope, he believed this difference was often reflected in the hand specimens. Generalizing, he noted the coarsely fibrous, pink to white, material usually proved to be his *thomsonite* and the fine, radiated, multicolored specimens his *mesolite*. He followed Peckham and Hall in calling the green zones and the grayish green amygdules *lintonite*. Intergrowths or physical mixtures of the different substances he found to be common.

In view of the frequent misspelling of the word "thomsonite" on showcase cards and even in published articles, it is inter-



Sketch Map Showing Location of Thomsonite Beach, Minnesota.

esting to note that this mineral was named in honor of Dr. Thomas Thomson, a regius professor of chemistry in the University of Glasgow, Scotland. The term was proposed in 1820 by H. J. Brooke[7], a British mineralogist, for some zeolite material found near Glasgow which formerly had been included in the now obsolete designation of mesotype. Thomson[8] later in the same year published a description, with chemical analysis of the Scottish thomsonite.

The term lintonite was proposed in 1880 by S. F. Peckham[9], professor of chemistry, and C. W. Hall, professor of geology, both in the University of Minnesota. It was applied to the dense, grayish green variety of thomsonite found in the vicinity of Thomsonite Beach. The name was selected to honor Miss Laura A. Linton, a graduate of the University of Minnesota class of 1879 who had made chemical analyses of the material.

Turning our attention to Thomsonite Beach, this famous mineral locality is a relatively restricted area along the shore of Lake Superior extending for about ¼ mile southwest from Terrace Point. The latter is a low promontory marking the southeast end of Good Harbor Bay. This indentation is one of the few natural harbors or bays along the Superior coast in Minnesota. The accompanying sketch shows the general relations.

The area is approximately 105 miles northeast of Duluth and 5½ miles "this side" (southwest) of Grand Marais. This is the "Grand Marais" locality cited in the mineralogical literature. U.S. Highway #61, the North Shore Drive or Lake Superior International Highway, a fine new black-top road now passes within a few rods of the collecting ground making it easily and quickly accessible. The recent relocation of this section of the highway has proven an additional blessing since in the excavation of a deep cut much fresh thomsonite-bearing basalt was exposed and blocks of the material removed are still available along the sides of the adjacent fills.

Regarding detailed directions, the Beach lies almost exactly 4 miles "beyond" (northeast) the Cascade River, lakeward from where the road makes a sweeping curve just before entering a deep rock cut. A convenient parking turnout will be found at the west end of the long guard fence at the beginning of the curve. A less desirable one is located at the other end. From the former, several indistinct trails lead to the shore. It makes little difference which is taken since the distance to the lake is only about 300 feet and a reconnaissance, at least, of the entire accessible shore will prove interesting.

Thomsonite Beach, in a restricted use of the term, is a small pocket beach, or shelving rock-walled cove, about 65 feet

Looking North from Thomsonite Beach. Terrace Point in foreground with Good Harbor Bay extending in to the left. Typical coast escarpment in the distance.

across, located some 100 yards west of Terrace Point, the eastern termination of this segment of the shore. Unfortunately, for the past several years the surface of this small beach has been covered with basalt cobbles and other coarse debris. However, on earlier visits the writer found the surface to consist in general of water-worn gravel which yielded many small but fine thomsonite pebbles. Even under the present adverse conditions, a little digging will produce a worthwhile specimen or two.

The geologic setting of the area is simple. The shore here is low, rock-bound, and relatively straight. The bedrock consists of a thick, greenish black, amygdaloidal basalt flow of Keweenawan age. It is the same type and age of rock with which is associated the native copper of the Keweenaw Peninsula of Michigan. This ancient lava flow now dips at a low angle (10° - 15°) to the south. The relatively straight shoreline represents the intersection of this inclined lava bed with the lake surface.

The primary occurrence of the thomsonites is as amygdules, commonly from 1/4 to 1/2 inch in diameter, filling the former bubble holes in the upper portion of the flow. The material also may be found filling joints and other fractures in the rock. These zeolites appear to be more resistant than the enclosing besalt and hence when released from it by weathering they tend to accumulate, through wave action, as water-worn pebbles in the pocket beaches and small rock basins along the shore. The presence of thomsonite in the walls of the new highway cut has been mentioned. The rock here apparently is part of the same flow which is exposed at the edge of the lake; the inclination of the bed being responsible for the difference in the elevation of the two areas.

Lintonite, the dense green variety of thomsonite, has the same dual mode of occurrence along the shore. The most fruitful area for prospecting seems to be in the west half of the accessible strip of shore. Many specimens are procurable in the weathered, slabby rock adjacent to the vegetation.

In addition to the presence of thomsonites, other features of geologic interest may be observed in the vicinity of Thomsonite Beach. Traces of Glacial Lake

Thomsonite Beach in 1932. The surface then consisted largely of coarse gravel and pebbles of amygdaboidal basalt. Rounded, water-worn thomsonites were relatively abundant in this beach material.

Duluth are seen in the two distinct terraces or "steps" crossed in descending from the highway to the lake. Water-worn pebbles, including thomsonites, can be found on them. The upper or old highway into Grand Marais is built in part on a similar higher beach.

Many examples of minor landforms due to marine erosion are present. The generally sudden termination of the basalt at the edge of the water is the result of wave erosion, ie., it is a wave-cut cliff. Small caves are common along this strip and toward the west end of accessible shore zone there is not only a small cave but also a fairly good natural bridge and associated stack, or pillar.

Good Harbor Bay is a picturesque indentation in the coast. The highway skirts the inner side, and along it for upwards of a thousand feet may be seen exposures of gently dipping reddish brown beds of loosely consolidated sandstone and shale. Ripple marks, mud cracks, and other evidence of shallow-water deposition are abundant. No fossils have ever been reported from them. The contact with the overlaying "thomsonite flow" is well shown. Although the base of these beds is not observable, the total thickness is considerably over 100 feet. This deposit constitutes the thickest known sedimentary series interbedded with the Keweenawan lavas along Minnesota'a North Shore[10]. The sediments are less resistant than the adjacent igneous rocks and hence the bay was eroded or developed where the waves had an opportunity to come in contact with them.

In conclusion, the writer feels Thomsonite Beach is one of the most interesting mineral localities in Minnesota. Although thomsonite occurs at other places in the Keweenawan flow region of the state, the finest and most highly colored "eyes" seem to be restricted to this area. A visit here should be on the "must" list of every mineralogist or amateur lapidary motoring anywhere in Northeastern Minnesota. The trip involves no hardships on either car or driver and the scenery is attractive. The shore and vicinity is private property but the owner generously permits visitors. This privilege be-

General view of rocky shore at Thomsonite Beach. Hans B. Larson, an old-time thomsonite prospector, removing thomsonite amygdules from the weathered slabby basalt.

speaks gentlemanly conduct. If you go, curb your collecting instinct for the benefit of those who may follow.

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8 T. Thomson, "Chemical Analysis of the Needlestone from Kilpatrick in Dumbartonshire." *Annals Phil.*, Vol. XVI, pp.401-412, 1820.

9 op. cit., p.130.

10 G. M. Schwartz, *Personal communication.*

ROCKS, MINERALS, IRON

By D. LAMON, M.E.

IRON is the basis of civilization and of every industry. The Bible tells us in Genesis, Chapter 4 Verse 22, that Tubal-Cain was an instructor of workers in iron, and to him we give reverence as the father of the metallurgy of iron.

Ages ago old Mother Nature built stronger vaults in mountains, than we men could conceive of. Mother Nature by her coloring and signs guided the iron worker to the door of these vaults. Governments handed him legal title to all therein. The development by steel, drill, blast, pick and spade broke the combination and unlocked the iron in the rocks.

But for iron our government would be bankrupt.

Iron Mines will be producing millions in the future, when many other industries will be only a sad recollection.

Iron Mines contain a crop already raised to be harvested and are deposits for humanity to check against for the future. The wealth gathered from the iron created and immortallized—Civilization.

Iron and its derivative steel and now iron and its *alloys* have made the United States the richest country in the world. It is the second largest industry in the United States. Iron has placed more poor men in the millionaire class than any other agency. The records show it. Without the products of the Iron Mines, we would have neither a frying pan nor the Empire State Building, nor the Aeroplane.

AN HISTORIC METEORITE

A slice of a meteorite which, according to an ancient Arabian legend, was a block of gold when it fell to earth, and was twice changed by God—once to silver, and finally to iron—as a punishment to tribes who quarreled over its possession, has been acquired by Field Museum of Natural History, Chicago, Ill. It has been placed on exhibition in that institution's collection of meteorites, the largest such collection in the world.

The authentic history of this meteorite, known as the Tamentit iron, although not as strange as the Arabian Nights type of tales told about it by the natives of the region where it fell, is nevertheless also extraordinary. It arrived on the earth hundreds of years ago near the Tamentit oasis in the Touat, Sahara Desert, and it is the oldest iron meteorite, actually seen while falling, which has been preserved, states Henry W. Nichols, chief curator of the museum's department of geology.

"For hundreds of years this meteorite has been the mascot of the people of the Tamentit oasis, and if we could only believe all that is told of it in an old, undated Arabian manuscript it would be the most extraordinary object in Field Museum or any other museum," Mr. Nichols said recently. "According to this manuscript, called El Bassit, a block of gold fell between Noum in Nas and El Tittaf in the Sahara during the time when the Oulad Nesslem, the Oulad Yacoub, and the Oulad Daoud occupied Tamentit. Each of these peoples prepared to take it home, but each encountered the opposition of the others. Quarrels arose, and God changed the silver to the iron of which the meteorite is now composed. Later, in the time of the Oulad Ali ben Mousa and the Sheik Amr', the meteorite was taken to the Tamentit oasis.

"Digging into its authentic history, we find that the Tamentit iron fell toward the close of the fourteenth century—the exact year is not known—in the Sahara Desert somewhere between seven and twenty-four miles from the oasis of Tamentit in the Touat. Sometimes between 1392 and 1413 it was moved by order of the Sheik Amr' to Tamentit. Here it lay in the street in front of the mosque, projecting sixteen inches above the ground in which it was partly buried from about 1400 to 1827, when it was moved to France. Because the Arabs believed it to be a mascot of great virtue and importance they had constantly avoided touching it as far as possible, and tried to prevent animals also from touching it. Before the French could obtain the consent of the natives to take it away, they found it necessary to conduct long and difficult negotiations, lasting more than two years. After consent was obtained, difficulties were encountered in transporting it from the desert over 1,000 kilometers to the coast. However, these were overcome and in 1827 the meteorite reached Paris, where most of it now rests in the National Museum."

Complementing Field Museum's specimen representing the Tamentit meteorite as the first iron meteorite ever seen to fall and afterwards to be preserved, the Chicago institution also has a piece of the Ensisheim (Alsace) meteorite which was the first stone meteorite ever preserved after being seen to fall. The Ensisheim stone fell in 1492, or about one hundred years after the Tamentit iron.

FORMS OF SILICA, FLINT, CHERT AND BEEKITE

By W. E. HOWARTH

Department of Geology, National Museum of Wales, Cardiff

The British Isles are not especially notable as a source of quartz, though the smoky-brown variety of crystallised quartz has been given the name of Cairngorm from the locality in Scotland where it is found.

The cryptocrystalline forms of silica, however, are widely distributed, especially in England, and one particular form —flint—is a very characteristic constituent of the chalk which constitutes the upper part of the Cretaceous rocks of England. Another cryptocrystalline form of silica, also found in large quantities in the British Isles, has been given the name of chert, and it is often extremely difficult to differentiate between them. In my youth, it was the fashion to distinguish between the two by means of the fracture, and this is a rough and ready way of determining them, flint having a conchoidal fracture, whilst chert usually possesses an even or flat fracture. One American (Tarr) has defined flint as the black variety of cryptocrystalline silica and regards all other varieties as chert, but I am afraid the distinction is not so easily determined in that way, and depends as we shall see, rather on the differences of origin and in the mode of occurrence. Indeed there is now a tendency in the British Isles to confine the name flint to cryptocrystalline silica which

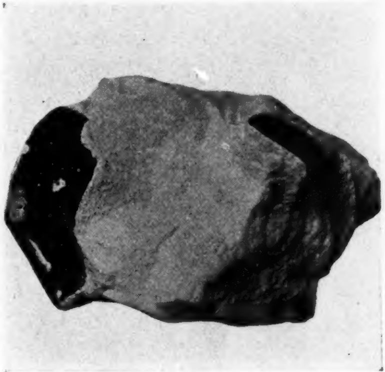
Chalk (Upper Cretaceous) Beer Head, Dorset, England.

Flint nodules show as lines of dark dots parallel to the bedding which is nearly horizontal. The people at the base of the cliff are members of the Geologists Association of London.

occurs as a bedded constituent of the chalk.

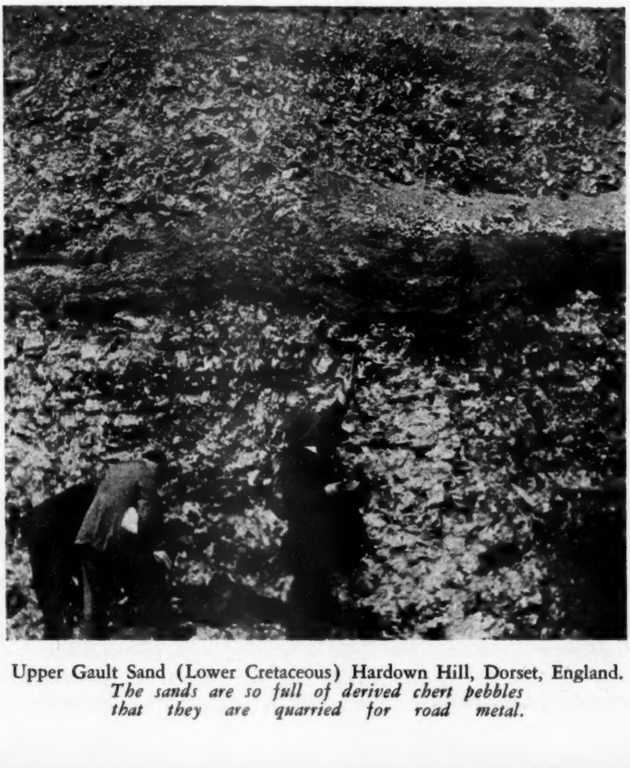
Wherever chalk is exposed in quarries or cliffs, flint may be seen as continuous or intermittent layers of darker colour always parallel with the bedding. The commonest occurrence is as more or less spherical nodules which are often fantastically shaped, and may simulate the form of animals and limbs so that they are often brought to the Museum here as examples of petrified heads or babies feet. They have, of course, no relation to such features, though they do often contain fossil shells, sea-urchins and sponges, indeed the latter which contain siliceous spicules have often served as the nucleus around which the flint has formed.

The interior of the flint nodule is usually either spongy, with abundant sponge spicules or else it contains a centre of crystallised quartz. Around this centre

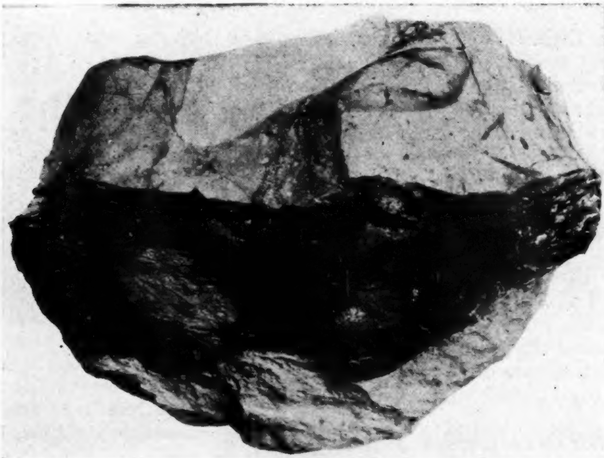


Flint Nodule In Chalk
(Specimen about 4 inches long)

The surface is white or light grey and similar in appearance to chalk, but the black interior is shown in the fractured parts to left and right.



Upper Gault Sand (Lower Cretaceous) Hardown Hill, Dorset, England.
The sands are so full of derived chert pebbles that they are quarried for road metal.



Chert Nodule In Jurassic Limestone
Portland Limestone, Portland, Dorset, England.
(Specimen about 4 inches long)

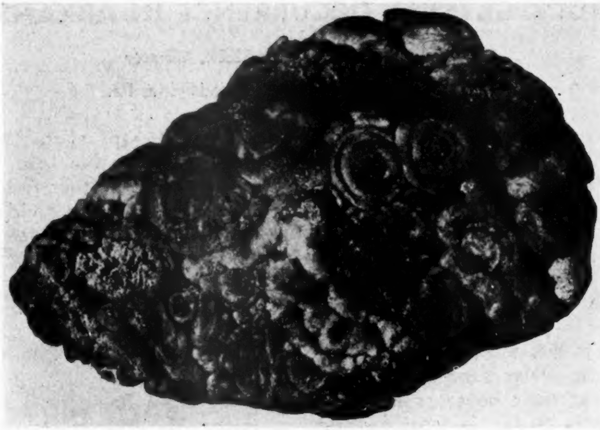
the flint is composed of cryptocrystalline silica, very compact and hard, and black, dark grey or sometimes light grey in colour. The outer coating of the nodule is as white as chalk, and is porous due to partial solution of the outer surface.

A striking feature of the flint, as seen in exposures, is the regularity of spacing of the beds, and it has been suggested that this is due to the fact that the silica existed in solution or as a gel disseminated through the chalk, and that introduction of other solutions caused a "rhythmic deposition" of cryptocrystalline silica after the manner of the formation of "Liesegang's rings." These latter may be easily formed experimentally by making a mixture of a 10% solution of potassium chromate, and a saturated gelatine solution. On adding a 10% solution of lead nitrate to this mixture drop by drop, lead chromate is formed as a yellow precipitate, but instead of forming a homogeneous yellow mass, the lead chromate is deposited in rings which are equally spaced if uniform conditions are maintained, the spacing depending on the relative strengths of the solutions.

Flint has been used in the British Isles from time immemorial for making axe heads, and arrow heads by the Stoneage folk, and later for the flints of muskets, whilst in many parts of the country it is used for building and road-making though the latter use is now disappearing, owing to the bad effect of hard sharp flint fragments on modern motor-tires!

As I have already said perhaps it is most satisfactory to regard as chert all forms of bedded cryptocrystalline silica which do not occur in the chalk, and these are found in almost all formations in the British Isles, but especially in the lower Carboniferous (here called Carboniferous Limestone). They are often found on microscopic examination to contain the siliceous remains of fossil protozoa belonging to the group of radiolaria, and we believe that the original source of both flint and chert must be sought in the silica derived by the solution of these organisms or of sponge spicules and the deposition of the silicon dioxide in the manner suggested above.

The occurrence of a related form of cryptocrystalline silica is also interesting.



Beekite Replacing Surface of Pebble of Middle Devonian Limestone
Torquay, Devon, England
(Specimen 1½ inches long)
The interior is hollow, the remainder of the limestone having been dissolved by percolating water.

This is the replacement of calcareous matter, especially the shells of fossils, by discs of cherty material which may eventually coalesce to replace the whole of the fossil shell, so that oysters for example, when converted into this form of silica (called Beekite) take on a curious warty appearance. In addition, pebbles of limestone are frequently superficially converted to beekite whilst the interior is removed by solution giving a pebble deceptively light in weight. Such a pebble is illustrated in fig. 5.

LARGE GARNETS FOUND IN WYOMING

A deposit of garnet crystals, some of which are large, weighing over 2 lbs each, has been found by John L. Funk, of Laramie, Wyo. The garnets occur in a large vein of mica schist with some of the mica (biotite) also grading into large crystals.

Many of the garnet crystals do not show well defined faces; they are rather dark in color and none are of gem quality although a large crystal that had been sliced by a diamond saw showed portions sufficiently free from imperfections and evenly colored to justify facet cutting.

The garnet crystal deposit is near Mr. Funk's spar, mica, beryl and tantalite-columbite mine, approximately 6 miles from Fox Park, Wyo., and 3 miles from the L. N. P. & W. R. R. Fox Park is in the southwestern part of Albany County (close to the Colorado border) which in turn is in the southeastern part of Wyoming.

The schist is very soft and no difficulty is experienced in freeing the crystals.

Mr. Funk is a member of the Rocks and Minerals Association, and is the proprietor of a mineral shop, *Wyoming Minerals,* which is a regular advertiser in ROCKS AND MINERALS.

Merry Christmas and a Happy New Year

The Editor of ROCKS AND MINERALS *desires to wish for all its readers a most joyous Christmas and a New Year of very real prosperity and happiness.*

A ROCK CRYSTAL OCCURRENCE IN ARKANSAS

By CHARLES R. TOOTHAKER, Curator

The Commercial Museum, Philadelphia, Pa.

I have been very greatly interested in reading QUARTZ FAMILY MINERALS by Dake, Fleener and Wilson. What is said on page 51 in regard to the origin of quartz crystals is excellently written. It reminds me of what I observed in Arkansas some years ago in the region near Hot Springs. Just a few miles out of the city there is a place known as Crystal Springs and in that neighborhood I found a dozen places where farmers had a lot of tables near their houses with specimens of quartz crystals laid out for sale to any passerby. Unfortunately, there was hardly a single specimen which I could call even reasonably good to be found at any of these places. All the terminations of the crystals were broken or imperfectly formed. However, I talked with several men and asked them where and how they found the specimens. The answer was always. . . . . . "Oh out in the field. We dig for them." Apparently they dug anywhere and sometimes ran into the crystals a few feet below the surface, at a depth of from three feet to ten or twelve feet.

Finally, in order to make me understand, one man told me to look in the side of any road cut and I would find them for myself. Fortunately, new roads had recently been constructed and many new grades had been established. I stopped my car at a place where a new road cut through a hill to a depth of perhaps thirty feet. The cut ran through perhaps four feet of soil underlaid by several layers of gravel and sand. The gravel, of course, was a mixture of pebbles of various sizes with plenty of clayey material. In the gravel I saw a streak which showed suspicions of crystals. I scratched away ten or twenty pound of the gravel in one place and another. What I found in the end were many, more or less horizontal or slightly sloping, veins of quartz crystals, apparently anywhere in the gravel. No vein was actually continuous for more than perhaps a foot or eighteen inches in length. No vein I saw was more than three or four inches thick at any one place. But you could easily trace the line of a vein of crystals for a distance of from six feet to twenty feet on the gravel wall of the road; a perfectly clear wiggly line if you looked carefully. Below every such vein the clayey gravel seemed a little denser than the rest of the bed.

In digging I found that, in the veins of quartz, the material at the top and bottom was rough but there was always a tendency, or more than a tendency, it was the rule, that there were prisms of quartz projecting downward from above and upward from the bottom so that the crystal terminations pointed toward each other in the middle of the vein. Usually, in fact, almost always, the space between the crystals below and those above was nearly filled with clay and sand, but the crystals themselves were clear and transparent. It was unusual to find a sheet of the crystals as large as one's hand that would hold together and the crystals were imperfectly formed. In other words, the vein was interrupted by an eighth of an inch or a couple of inches of space where there was no crystallization of quartz at all. Most of the prism faces were good but the terminal faces were very imperfect.

I can think of only one explanation of how the crystals came to be where I saw them. They could not have been brought there with the gravel for the crystal edges and corners were all sharp and clean; therefore, they were never rolled around. Furthermore, they lie with the prisms generally in a more or less vertical position projecting downward from above and upward from below. The prisms practically never lie in a horizontal position.

The quartz crystals were originally formed just where I found them. Water percolated and seeped through the gravel. When it came to a place where there was a fairly dense layer in the gravel it ran along horizontally or slightly downhill and carried away the finest of the clay with it, leaving a tendency toward an open space. Here the water collected and lay, being fed by water from above and working down and away slowly. This water lying in the gravel as a sort of pool now and then two or three inches deep, was almost never free from clay and pebbles but the water was saturated with silica and from it the crystals formed.

The silica which saturated the water may easily have come from the gravel itself. While the pebbles in the gravel are quartz and we will grant for the sake of the argument that the quartz pebbles themselves are insoluble, there is in the gravel plenty of feldspar or other silicates. These in the usual processes of nature are sure to turn to kaolin or some other clayey material. When this happens silica is separated and it must go somewhere. In this case it went to form quartz crystals. Many years ago I wrote down the same formula you find in QUARTZ FAMILY MINERALS as other men have also written it. Take orthoclase feldspar, water and carbon dioxide, and if you get a chemical reaction you must form kaolin, potassium carbonate and quartz.

The silica will at first be in a water soluble condition. In the earth you will have a great deal more water than is necessary for the reaction and some of it will carry away the potassium carbonate which is very soluble while the silica will remain behind with the kaolin or other clay which has been formed.

Of course, the fact that there are hot springs a few miles away makes it easy for us to suppose that within a few thousand years at the most, these gravels may have been acted on by hot waters and that may have helped in decomposing the feldspar and other silicates and in forming quartz crystals in the whole region within a few miles of the location of the present Hot Springs, Arkansas.

Personally, I have no doubt that all of the crystals from this famous locality have been formed in this way and that they are of fairly recent geological origin. I am willing to believe that the veins I dug out were formed perhaps as recently as within the past few hundred years and perhaps much longer. I see no reason to doubt that in the vicinity crystals are now in process of formation.

I believe also that the quartz crystals in many other localities were formed in the same manner, probably more of them than we suppose.

HUGE TOPAZ CRYSTAL FOUND IN BRAZIL

The world's largest topaz crystal—350,000 carats (153 pounds) in weight—has recently been added to the mineral collection of the U. S. National Museum, Washington, D. C.

This large and well formed topaz is a very fine example of a topaz crystal and forms a most unusual mineral exhibit. There is little or no gem material, but its perfection of crystal form makes it an extremely fine display. The color is slightly yellow with a few areas almost colorless.

It is approximately 12 inches high and roughly 12 by 15 inches in the two other dimensions.

This topaz crystal was found by a gem dealer near Ferras, Minas Geraes, Brazil.

OPALIZED WOOD OF MESA COUNTY, COLORADO

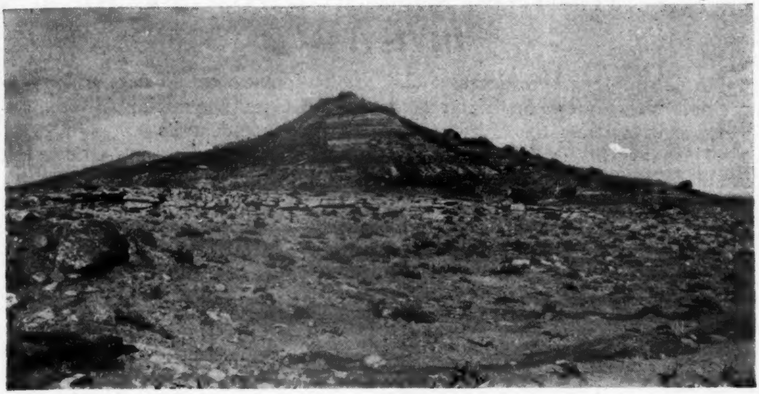
By W. C. MINOR
Fruita, Colorado

When Mother Nature decides to change wood to stone she must have a lot of different formulas and methods, for the results are far from uniform. Just take a glimpse at some of the different types of petrified woods to be found: Agatized wood, jasperized wood, opalized wood, wood turned to crystals of lime, wood that resembles coal and shale, wood that looks like lumps of sugar, petrified woods hard as flint, others so soft that you can crumble them with your fingers, petrified woods of gem quality and showy colors, petrified wood as dull colored and unattractive looking as ordinary clods of dirt, black, brown and yellow petrified wood, red, white and blue petrified wood. In fact, it would be difficult to name any shade of color that has not at some time or other been found in petrified wood. Opalized wood, though quite common in many places, is one of the most interesting of the lot. The writer, in this article, intends to describe a few of the different types of opalized wood found near his home in western Colorado.

South of the Colorado River, some four miles from Fruita, is a spot locally known as Opal Hill. A considerable amount of opalized wood has been found on this hill. No one knows just how much but it is a safe guess that several hundred pounds have been taken from this spot. As the hill is quite well known and easily reached there is not much of the opalized wood now left, except small fragments and pieces of very poor quality. However, even yet, an hour or so of hunting will usually discover a few specimens of gem quality, or at least of good specimen grade. But Opal Hill is not the only place in this locality where opalized wood has been found. Most of the hills along the Colorado River extending westward from Grand Junction to well into Utah are of the same sort of geological formation and opalized wood has been found over much of the area, no large amount, but mainly widely scattered specimens. The writer has also found good specimens in the Glade Park and Pinon Mesa districts south of here. This latter locality also furnishes a small amount of agatized wood of various colors, also a black petrified wood that is partly crystallized and has a sort of sugary look. There has also been found here a few specimens of a dull black shale-like petrified wood which is not especially attractive in appearance but in which the grain and growth rings of the wood show up with exceptional clearness.

Many of the different types of opalized wood make very pretty cut stones but, of course, lack the fire and play of color of precious opal.

A very remarkable change, indeed, takes place during the untold centuries that Nature requires to change a section of a tree from wood to opal. A somewhat quicker but almost equally radical change in the material takes place once the opalized wood has been exposed to the sun and weather. In this locality when opalized wood that has never been exposed to the sun is uncovered it is a translucent, practically colorless, material almost exactly like chalcedony. In fact, if it were not for pieces of bark on some of these specimens it would be hard to decide whether you have a piece of wood opal or a piece of colorless chalcedony. After being exposed to the weather it gradually develops a milky white color, sometimes tinged with yellow but more often pure white with a slight sheen, like opal glass-ware. This is the stage in which most of the opalized wood of Mesa Country is found, and though not especially colorful it is an attractive stone both as a rough specimen and after it has been cut and polished. The general appearance of the wood at this stage closely resembles milky quartz, hich is also found in this locality. The quickest way to tell them apart is to rub the specimens lightly with your fingers. The wood opal has a smooth, waxy feel that is lacking in the



Opal Hill

A scene along the Colorado River in Mesa County, Colorado.

quartz. But the change in the material does not stop when the opal has become white. After long exposure to the sun it loses its sheen and waxy appearance and becomes a dull, dirty white color and in time becomes almost as soft as chalk. Then the chalky material begins to crumble and at last completely decomposes to become a part of the soil. It would be extremely interesting to know how many years are required for these various changes to take place. Perhaps some reader of ROCKS AND MINERALS can furnish information on this subject. All these various changes of opalized wood from clear, translucent opal to crumbling chalk can be found at the same time on Opal Hill.

In addition to the color changes mentioned above opalized wood is occasionally found in other colors, sometimes several different shades of color in one specimen. Though specimens in these off-colors are not plentiful, the writer has seen a few pieces of light yellow, gray, blue and brown as well as several black ones. In certain expectionally fine and rather rare specimens, the heart wood is black, the outer or sap wood white and the outside a rough brownish material not unlike the original bark of the tree. The writer has found three specimens of green opalized wood. Not just faintly suggestive of green, but a good pea green color. The green is the rarest of the colors to be found here. Unfortunately, all of the green material found so far was in the advanced chalky stage and worthless as a cutting stone and not very attractive as a cabinet speciment.

Opalized wood not only changes color and texture on long exposure to the sun but checks or cracks badly. For this reason most of it is found in rather small fragments. Good solid one to two inch pieces are not uncommon. But specimens of any size that are entirely free of cracks or fractures are decidedly rare. The writer has found several fairly large sections or trunks or branches that would weigh twenty pounds or more which were rather attractive rough specimens but were so badly checked that it would be impossible to get a solid piece large enough to cut a ring size cabochon from the entire section.

This brief article has dealt entirely with specimens that have been found on the surface, or scratched out from beneath not more than a few inches of soil. If a collector with plenty of spare time and equipped with tools for digging in hard rocky soil were to do a bit of prospecting in some of the spots mentioned it is quite possible that large specimens of fine quality would be discovered.

STRATEGIC MINERAL DEPOSITS BEING INVESTIGATED.

In a major effort to improve the position of the United States in regard to strategic minerals, the U. S. Bureau of Mines now has engineering parties in the field investigating the possibilities of eight mineralized areas, Secretary of the Interior Harold L. Ickes announced Oct. 9, 1939.

The action was taken in accordance with the Strategic Materials Act which authorized the Bureau of Mines to appraise ore deposits containing metals that have been designated as strategic by the Secretaries of War, and Navy and the Interior upon advice of the Army and Navy Munitions Board.

The deposits now under investigation include antimony, chrome, manganese, tin and tungsten. When President Roosevelt commenting on possible foreign war demands recently called upon owners of commercial stocks of strategic minerals to refrain from selling them to foreign buyers because of their vital necessity to this nation and because of the restricted supply available here, these minerals, were among those he named.

The engineering parties now in the field will take samples from the deposits by excavation and drilling to ascertain their possiblities as sources of emergency supplies of these minerals. The work is being carried out in close co-operation with the U. S. Geological Survey, another agency of the Department of the Interior. The Geological Survey already has carried out extensive geological investigation of ore bodies upon which the Bureau of Mines is conducting exploration projects. The minerals to which the Bureau of Mines is paying particular attention include mercury and nickel in addition to those listed.

The projects now being explored by the Bureau of Mines are:

1. Valley County, Idaho—antimony deposits
2. Sweetgrass and Stillwater Counties, Montana—chrome deposits
3. Casper Mountain, Wyoming—chrome deposits
4. John Day, Oregon—chrome deposits
5. Olympic Peninsula, Washington—manganese deposits
6. Tinton, South Dakota—tin deposits
7. Catron County, New Mexico—tin deposits
8. Nightingale District, Nevada—tungsten deposits

The following statement was made public by the Bureau of Mines about these deposits:

In the Valley County, Idaho, district, there has been in the past considerable production of antimony associated with ores of the precious metals. There are, however, some known deposits in which the values of the precious metals have been too low-grade to warrant their mining. It is believed that a substantial source of antimony will be demonstrated in Valley County that would go far to relieve anxiety as to the supply of this metal in an emergency.

The chrome deposits in Sweetgrass and Stillwater Counties, Montana, are persistent veins upon which considerable development work has been done in the past. As the ores have been impaired in value by an intimate intermixture of chrome with iron, an important aspect of the problem will be investigations by the Metallurgical Division of the Bureau of Mines designed to demonstrate ways in which these ores might be most efficiently treated.

The chrome deposits at Casper Mountain, Wyoming, are believed to include an enormous tonnage of low-grade material extending for more than half a mile along a granite schist contact. This is in very rough country with an overburden that has rendered previous studies of these deposits difficult. With respect to the ores there will also be a metallurgical problem, as a characteristic difficulty of the Western chromites is their more or less intimate association with excessive amounts of iron.

The project near John Day, Oregon, concerns another large area of chromite, low in grade, but with tonnage possibilities that may render it extremely interesting.

The Olympic Peninsula of Washington contains numerous deposits of manganese located in rugged country, which have had relatively slight development, though one of the mines has made a substantial production. The investigation here will be concerned with the determination of the nature of the more highly mineralized areas. They are not fully contiguous.

The tin deposits in the pegmatites of the Black Hills at Tinton, South Dakota, have long excited considerable interest as a source of some production. The difficulty has been that the occurrences of tin are so scattered that little conclusive information can be obtained through examination of face samples. The investigation therefore is aimed at the determination of the tin content of the more promising areas through the concentration of mass samples representing substantial tonnage.

The tin deposits of Catron County, New Mexico, are of chief interest because the depositions of tin in very small amounts per ton are found in rhyolite over a vast region possibly exceeding 100 square miles. There is little hope that any known showing could be made commercial, yet it is conceivable that the tin concentrations might be more pronounced in some areas or that mining on a large scale could in an extreme emergency produce sufficient tin at high cost to deserve consideration. There are, in addition, some hundreds of miles of shallow placer concentrations in stream beds that might warrant high-cost recovery in an emergency.

The tungsten investigations started in the Nightingale District of Nevada relate to the possibility that large amount of high-cost tungsten could be obtained in an emergency from various contact deposits of the kind that are known to exist in a number of places throughout the country but especially in the Western States. The investigation will be carried out chiefly by diamond drilling. Reasonable success at this place might result in other similar investigations that would provide considerable assurance of substantial quantities of low-grade ore obtainable from domestic deposits even though at relatively high cost.

According to the Bureau of Mines, since the World War the strategic minerals situation of the United States has been improved in some respects but has become more aggravated in others. The nation is now better off in regard to nitrates, potash, platinum, molybdenum, vanadium, pyrite and antimony than it was at that time. However, the rapid increase in the use of alloys has made use more dependent than ever on foreign sources of manganese, chromium and nickel. The situation in these materials has been further aggravated by the depletion of the very limited high-grade reserves of manganese and chrome ores during the last war, and, in the case of nickel, by the transfer of refining operations from the United States to Canada. Since 1923, American manufacturers have obtained much of their ore for aluminum from South American bauxite deposits, and we are still dependent entirely on overseas supplies of tin.

While the prospects for disclosing large deposits of deficient strategic minerals in this country of present commercial grade are admittedly not bright, it is felt that relatively small deposits of commercial grade may be accompanied by "halos" of lower grade material that contain sufficient quantities of needed metal that could be extracted if the demand for the minerals becomes great.

Secretary Ickes stated that he had been advised by the Bureau of Mines that manufacturers have on hand fairly large stocks of strategic minerals and that no immediate shortages are anticipated. However, because acute shortages of mineral raw materials would be detrimental to the national defense, the Bureau of Mines has instituted monthly canvasses on the production, consumption and stocks of strategic minerals in addition to starting the explorations authorized under the Strategic Materials Act.

PROPOSED MINERAL MUSEUM FOR BLUE RIDGE PARKWAY

By BRADLEY JOHNSON, Penland, N. C.

Officials of the The National Park Service recently conducted a preliminary investigation on the different varieties of minerals found in the Spruce Pine district of North Carolina. This was done at the request of local business men, and collectors, who have asked the Park Service to establish a mineral museum as an additional attraction for visitors to the Great Smoky Mountains National Park region. This museum would be located at the most convenient point along the Blue Ridge Parkway, a scenic drive that will be 477 miles in length, connecting the Shenandoah National Park with the Great Smoky Mountains National Park, and now under construction.

The mineral wealth of the territory along this parkway is known all over the world, and the need for such a museum can easily be seen, especially by persons who have visited the district. Individuals, and companies, have done everything possible to conduct or direct all visitors interested in minerals to important nearby localities. These visitors, however, are increasing at such a rapid rate that it may soon be impossible to give each person the attention we feel he should have. A museum with trained personel would render a valuable service to collectors, by assembling representative collections of minerals of the Blue Ridge Mountains, and dispensing information on mineral localities.

In the near future there will be a hearing before the National Park Service on this project, the officials desiring to ascertain just how much interest in the proposed museum, is really manifested, especially among those residing outside the area to be traversed by the Parkway. For this reason we ask that all members of the Rocks and Minerals Association, and affiliated clubs, who are interested to express their views in a letter to The Director, National Park Service, Department of the Interior, Washington, D. C. Clubs should send a copy of their resolution favoring the project, instead of individual letters.

Immediate cooperation in this meritorious project will be greatly appreciated.

Editors Note: We are very sure that Mr. Johnson would appreciate a postal card from all readers giving him their views on the subject. Address him: Bradley Johnson, Penland, N. C.

. . Collectors' Tales . .

By PETER ZODAC

SAFETY FIRST

It very often happens that in the search for mineral specimens we often do the most ridiculous things imaginable. Sometimes we apparently have no brains at all, at least it would seem so in my case when I tried to explore an old iron mine.

It was during the summer of 1920 that the case in point occurred. At that time I was mining engineer for the Ramapo Ore Co., Lakeville, Orange Co., N. Y. We were opening up a very old magnetite mine (Scott Mine) which I had to visit at least twice a week if not more. This mine was especially noted for its nice epidote specimens.

About 20 ft. vertically above the first level were a number of old stopes (worked out chambers) which I tried time and again to explore but could never reach them as no ladder was available. Surely some nice crystals, possibly even stalactites, must be present in the old stopes as they extended almost to the surface, I reasoned! So on every visit I would pause below them and gaze up hungrily —like the fox at the grapes in Aesop's fables.

One day fortune appeared to smile upon me for right below one of the stopes were a half dozen or more long pieces of pipe. Two were picked up and leaned against the wall and the longer of the two lacked only about two feet from reaching the top. Dick Worthington, my assistant, was with me and he cautioned against doing anything rash. Without any thought at all on how I was to get down and totally ignoring Dick's warning, I shinned up the two pipes and in no time at all stood on one foot atop the longer pipe gazing eagerly into the stope. Nothing interesting was in the immediate foreground while all beyond was obscured in the darkness of the stope which stetched upward at a steep angle. I tried to crawl up and suddenly discovered that the floor was coated with a very thick layer of clay. Not a single handhold could be found! My position on the 2 inch pipe was a precarious one —it was not at all comfortable and in my struggle to obtain a handhold I was losing my balance. There I was 20 feet or so above the tunnel floor, standing with one foot on the end of a 2 inch pipe, my hands thickly coated with clay, no handhold available and fast losing my balance!

I cried out wildly—"Dick, get me another pipe, quick, I'm falling!

In an instant Dick was rushing towards me with a pipe but it hit the one I was standing on and —I fell off backwards. I do not recall losing my perch but I distinctly recall in my backward, headlong, downward fall of seeing a large pipe for which I was heading. The next instant I was standing on my feet, straddling that pipe. In my downward fall I had made a complete somersault and landed safely on my feet without even rumpling my hair, to straddle a 6 inch pipe that was elevated about one foot above the ground!

My interest in exploring the old mine, however, died then and there and never again did I attempt to climb up into the old stopes. I might add that the above fall took place close to the shaft where lights were burning which explains how the pipe was seen.

IMPORTANT FOSSIL FINDS IN COLORADO

A number of important fossil finds by the Field Museum Paleontological Expedition to Western Colorado are reported by its leader, Bryan Patterson, assistant curator of paleontology at the museum, in a letter received by Clifford C. Gregg, director of Field Museum of Natural History, Chicago, Illinois.

Oustanding is the skeleton of a prehistoric animal called Taeniodont. This is a representative of a small early group of hoofed mammals—a forerunner of a similar but larger creature excavated by Mr. Patterson in 1933 and known as Barylambda. The present specimen, writes Mr. Patterson, may constitute a new genus.

"We have been on the track of this beast since 1932, but until now have never found more than a few fragments of it," writes Mr. Patterson.

Other specimens collected by the present expedition include multituberculates (a group of small rodent-like animals characterized by many cone-like prominences on their teeth), and prehistoric turtles. Work has been begun on the excavation of a fossil crocodile, and a large collection of small fossil animals has been made.

Mr. Patterson is accompanied by James H. Quinn, another member of Field Museum's staff, and by several volunteer collectors.

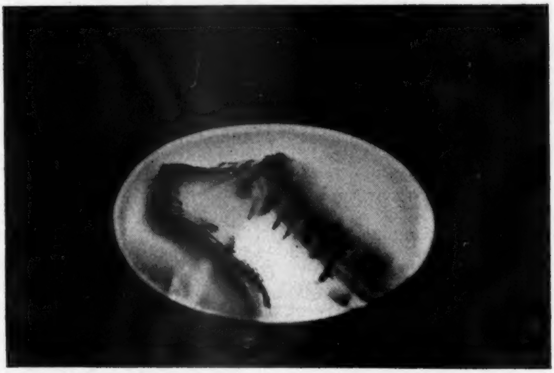
The field of operations lies in Mesa, Garfield, and Gunnison Counties, where an extensive series of formations belonging to various periods and eras in the earth's history is exposed. The work is mainly in late Paleocene and early Eocene deposits (the opening epochs of the Age of Mammals), with some attention also being paid to the late Cretaceous formations (the closing period of the Age of Reptiles). The main objective of the expedition is to collect fossil mammals from the Paleocene and Eocene. Specimens from these early horizons are of great interest to students of mammalian evolution. The dinosaurs and other reptiles that had previously dominated the earth were but a short time extinct (geologically speaking), and the mammals were just getting well under way. Many groups that no longer survive were flourishing, and several of the dominant mammalian types of the present times were represented by exceedingly primitive ancestors. Thus, for example, the horses of the early Eocene were small creatures no larger than foxes, and they possessed four toes in contrast to the modern horse's one.

In addition to the work on vertebrates, attention is being given to geological observations, and to the collecting of fossil plants. It is hoped that by means of the latter it will be possible to make somewhat more precise age determinations and correlations of the late Cretaceous formations than has hitherto been done.

Travel School of Mineralogy in Wyoming

The Travel School of Mineralogy in Wyoming, of which S. S. Dietz, of Cheyenne, Wyo., is director, is again proving very popular. Registration has leaped to a new high and the interest manifested in the project indicates that the citizens of Wyoming are fully cognizant of the value of mineralogy and of the opportunities to acquire knowledge of it. The school travels from town to town, the equipment needed for teaching mineralogy, which includes gem cutting and polishing and a large assortment of rocks and minerals, is conveyed by truck. Mr. Dietz, who is a a member of the Rocks and Minerals Association, is assisted in this meritorious work by Ralph E. Pratt.

A PICTURE AGATE FROM OREGON



The Dog In The Agate "Cage"

About two years ago Geo. W. Steel, of Toronto, Canada, obtained from the late Enos F. Hayward, of St. Paul, Minn., a number of rough moss agates. These were slabbed in the usual way with the diamond saw with special care taken to show up the inclusions. One piece showed promise and when ground down and polished gave the result as shown in the accompanying photo. The agate was full of small included feathers or cracks all of which were removed but the one directly under the dog's jaw.

The effect of the hair, the eye, and the ear are all natural effects of the inclusions. These are brown in a translucent blue-gray agate.

The picture was taken with a vertical setting of the camera. The agate was on a black velvet background. The lens used gave a direct enlargement of 1½ diameters. At this close range the depth of focus is extremely narrow, detracting slightly from the value of the picture as compared with the original.

The agate came from Roque River Valley, Oregon, a locality noted for "picture" agates.

A letter from Mrs. Hayward informs us that she has in her collection a number of picture agates of which, one, a rough specimen also from Roque River Valley, has a picture of a goat. Two other specimens, both brooch-size and polished, show in one a volcano spouting smoke while the other is a beautiful red plume. Both are from Oregon but their exact localities are unknown.

BRIDGEPORT MINERAL CLUB

The first fall meeting for 1939 of the Bridgeport Mineral Club was held on Monday, October 16th and the following officers were elected for the ensuing year: President, Arthur Sandiford; Vice-President, Earle Sullivan; Secretary-Treasurer, Mrs. Julia Walker; Director of Trips, G. E. Porter.

The speaker for the evening was Ernest M. Marshall, a member of the club, who gave an illustrated talk describing his experiences on a mineral trip through Mexico last winter.

The Brideort Mineral Club meets on the third Monday evening of each month in the lecture room of the Public Library, on Broad Street, in Bridgeport, Conn.

CLUB AND SOCIETY NOTES

New York Mineralogical Club

The first fall meeting of the club was held Wednesday evening, October 18, 1939 at the club's headquarters, American Museum of Natural History, New York City. The meeting was devoted to summer collecting experiences of the club members. Four members, each one displaying some of the specimens he had collected, were the chief speakers.

Merton McKown spoke first. He related visiting a number of localities among which were a limestone quarry at Saratoga Springs, N. Y., a zinc mine at Balmat, N. Y., and the talc pit at Chester, Vt.

Herbert Gray was the second speaker. He had spent five days during the third week of August among the trap rock localities of Nova Scotia and had a most successful time of it too judging by the large number of nice specimens that were displayed.

James F. Morton spoke enthsiastically on four localities he had visited in California and Arizona. The first one was an old cinnabar mine (abandoned for many years) at Skaggs Springs, Calif. A little curtisite and also a good specimen of napalite were found. The second locality was Tick Canyon, Ventura County, Calif., where an old colemanite mine was visited. Here on the enormous dumps colemanite was available, also howlite in different forms, priceite and ulexite. This was an interesting locality and worth visiting, he stated. The third locality was the world famous Crestmore limestone quarry, near Riverside, Calif. Phillipsite, a mineral never reported from this quarry, was found together with many other interesting and several rare species and types. The fourth and last locality, also world famous, was the Copper Queen Mine of Bisbee, Ariz. On the dumps of the old copper mine many interesting minerals were collected, including shattuckite. Exceptionally choice specimens of a rare uranium mineral, tyuyamunite, were given him by the company.

John Radu, the last of the members who exhibited specimens, gave an interesting resume of a visit to a sand quarry at Berkeley Springs, W. Va., where immense quantities of fossils were available on the dumps. High up above the floor of the quarry he spotted a large pocket of milky quartz crystals and after much difficulty in which a quarryman assisted him, he was able to obtain a number of good specimens.

An unexpected treat for the members was the presence of A. N. Goddard, of Detroit, Mich., a member of the Michigan Mineralogical Society and also of the New York Mineralogical Club. Toward the close of the meeting, when it seemed that everyone present had nothing more to say and still a number of minutes were available, Mr. Goddard arose and after extending greetings from the Michigan Society and an invitation to visit one of their meetings, he proceeded to give the most interesting travelogue on mineral collecting that we have ever heard. He touched on personally visited localities in almost every state in the Union. At least it seemed so to us but we were so fascinated we forgot to take notes and cannot check on this. We do recall his mentioning a large cave, 8 ft. long and 3 ft. wide, in the limestone quarry at Clay Center, Ohio, which was lined with very fine celestites and fluorites.

A large number of members and guests were present at the meeting. H. R. Lee was the presiding officer with Dr. F. H. Pough at the Secretary's desk.

NEW HAVEN MINERAL CLUB

At the Annual Meeting of the New Haven Mineral Club held on Mon., October 9th, the following officers were elected for the coming year:

Jerry Crowley—President
William Ducharme—Vice-President
Sadie Crowley—Treasurer
Lillian Otersen—Secretary

The report of the outing committee was most satisfactory as an avergae of 35 members attended each of the eight outings during the summer. The Program Committee has outlined an exceptionally fine program for the winter for each meeting which will be held on the Second Monday in the month at 8:00 P. M. in Room 218, 19 Congress Avenue, New Haven, Conn.

The U. S. Department of Interior, Pittsburgh, Penna., loaned the club three reels of movies covering Copper Mining in Arizona whose showing at the Annual Meeting met with the approval of the 75 members and guests present.

Dr. Frederick H. Pough, of the American Museum of Natural History, New York City, will be the guest speaker at the next meeting which will be held Mon. Dec. 11, 1939, at 8:00 p.m. His address will be on Norwegian and Swedish mineral localities, illustrated by colored slides. Those of our members who had the privilege of hearing Dr. Pough last June, at the Convention of the Rocks and Minerals Association held at Peekskill, N. Y., are looking forward with great pleasure in hearing him again.

Lillian Otersen, *Secretary*

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Jan.	1939	14	1	90	1- 32
Feb.	1939	14	2	91	33- 64
Mar.	1939	14	3	92	65- 96
Apri.	1939	14	4	93	97-128
May	1939	14	5	94	129-160
June	1939	14	6	95	161-192
July	1939	14	7	96	193-224
August	1939	14	8	97	225-260
Sept.	1939	14	9	98	261-296
Oct.	1939	14	10	99	297-332
Nov.	1939	14	11	100	333-368
Dec.	1939	14	12	101	369-404